



Morning Star

Winter 2022



*** Club Info ***

Announcements

Check out our Member [Forum](#) on our web site (vtastro.org), under Discussions.

Several [past meeting presentations and newsletter articles](#) on imaging, observing and equipment are posted on our web site, check them out.

[Past newsletters](#) are posted on our web-site under What We Do.

Associate Members interested in becoming full members make your interest known to one of the board members. To become a Full Member one has to actively participate in club functions and events and be active in some other aspects of astronomy (more details are in our by-laws).

Moving or Changing Email?

Please send changes to Paul Walker, 53 Valley View, Middlebury, VT 05753, paulwaav@together.net (info@vtastro.org will also work)

Hinesburg Observing Site

We have an observing site in Hinesburg, VT. (Located on town property). A locked gate (required by the town) limits access to the site.

Associate Members can request access to the gate lock. They have to be a member for 3 months. This provides access to the Warming Hut, 115v AC power and port-a-potty and the Teaching Dome.

Full Members can request access to the gate lock, Green Mountain Observatory (18" Obsession) and the

Chmela Observatory (5" folded optics planetary scope) locks.

Board approval is required for Associates. Some training is required in all cases. There is a training checklist and an access agreement that need to be filled out.

Contact the Secretary, Paul Walker or Jack St. Louis for more information at info@vtastro.org

Observing List for HOS

We have an email list for members interested in getting a heads-up when someone will be at the Hinesburg Observing Site (HOS).

If interested in getting on the list contact info@vtastro.org

Observing Certificates

Several certificates (beginner to advanced) are available to members as encouragement to get out under the stars and hone their observing skills. Follow the link on our web site.

Outreach

Acknowledgment Letter

To help record our broad community involvement with public star gazing events, projects and classes, we have developed an Outreach Acknowledgment Letter with a Sample Form. It is posted on the website and can be found under **Members, VAS Club Materials for Members, Outreach Acknowledgement Letter.**

Direct Link: http://vtastro.org/wp-content/uploads/2018/03/VAS_Outreach_Ack_Letter_V3.pdf

Dues

Due the first of each year.

Associate Members \$15

Full Members \$25

Send dues and any address or email updates to VAS, PO Box 782, Williston, VT 05495. Or bring to any monthly meeting or Contact Paul Walker, 802-388-4220, paulwaav@together.net.

Connect On-line

www.vtastro.org

[Twitter@VTAstroSociety](https://twitter.com/VTAstroSociety)

[Facebook.com/Vermont-Astronomical-Society-113053818706458/](https://www.facebook.com/Vermont-Astronomical-Society-113053818706458/)

Email: info@vtastro.org (Goes to the President and Secretary)

webmaster@vtastro.org

(Goes to Secretary and Webmaster)

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(My apologies if I missed anyone)

Teaching Dome Announcement

Hello VAS members,

It is my pleasure to announce the Teaching Dome observatory is ready for use. Although my original intention was to provide Associate Members with their own observatory, it was determined by the Board to use the Dome to teach newcomers to astronomy how to locate objects in the sky, how to use this and other telescopes, the views different eyepieces provide, the use of an equatorial mount and the GoTo feature and even beginning astrophotography.

Also, if no training is occurring any member can use the Dome, I would like to try it myself.

The supporting platform for the dome was designed, built and donated by VAS member Keith Lawrence; other members helped to assemble the base at the site, including putting the concrete pier in place. The observatory was donated by former Hinesburg resident Dr. Russell Patterson, the riser box attached to the concrete pier that holds the EQ mount and scope was designed, built and donated by Keith. The Orion EQ-G Atlas GoTo mount was donated by VAS member Terri Zittritsch. The Meade 8" SCT scope and accessories were donated by VAS member Tom Yandow. Power was installed by VAS member Paul Walker with help from a couple others.

The accessories include eyepieces, adapters, filters, and other goodies, and are located in the observatory in two pull-drawer containers. There is also a white light Solar filter which I believe is in good condition.

The lock combination is the same as the gate, Bob's Hut and Porta-Potty, so that all Associate Members who have the combination will have access to the Dome. As can be seen in the photos, a locking frame was attached to prevent unauthorized access. To use the equatorial tracking and GoTo system, the power needs to be turned on in Bob's Hut, then use the mount power switch. Additional AC outlets

are provided in the Dome for computers and other equipment.

Other VAS members helped with the installation of the Teaching Dome, their efforts are greatly appreciated. Sorry we didn't record everyone's names.

Anyone wanting help to use the Dome can contact any Board member and we will get you started.

Enjoy this latest addition to the VAS Hinesburg Observing Site,

---Jack

Jack and I will make ourselves available to do training. There may be others as well or in the future but I am only aware of the two of us at this time.

As Jack said, contact any Board member. You can also email info@vtastro.org (Jack and I receive these emails).

Take note, in case you are like me and might find yourself poking around the Teaching Dome.... The shutter has 2 latches, one on the bottom end and one on the top end. When both are unlatched the shutter halves should open fairly easily, though you may have to nudge both the top and bottom ends to get them started. The bottom latch is a piece of aluminum with a notch in it, the top latch is a very short rubber bungee with a handle on it. The latches hold the 2 halves together when the shutters are closed. There is a step stool for reaching the top latch.

---Paul



Scott and I finishing installation of the mount.



Completed installation (I'm there just for scale).



Closed



Open

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Jack on the Radio

Listen to Jack's astronomy update on radio station WJOY AM (AM 1230) on Ginny McGehee's 'Breakfast Table' morning show. Aired the first Wednesday of the month at 8:40 AM.

Gary's Astronomical Events for the Month

can be viewed via WCAX at <https://www.wcax.com/weather/astronomy>

Stargazing and other Events

All observing events are weather permitting unless otherwise stated.

Bring extra clothes. Even a summer evening can be chilly after standing still for a couple hours in damp air. We have an email list for members interested in getting a heads up on impromptu events at the Hinesburg Observing Site (HOS).

If interested in being on this list contact info@vtastro.org

Events are listed on our website (vtastro.org) and Google Calendar (<https://calendar.google.com/calendar?cid=Nzc5dnQ1bnZrN2ljcDA2NG9vbXFnczI1M2NAZ3JvdXAuY2FsZW5kYXluZ29vZ2xlLmNvbQ>)

Member & Invited Guest Star Gazing at HOS & other events

Keep watch for emails announcing impromptu observing at the Hinesburg site.

Note: If you would like to be a host, greeter/orienteer or want some training on operating the scopes let Paul Walker know.

Corona Virus Note:

We will follow the current State COVID restrictions recommendations.

Contact info@vtastro.org

Public Star Gazing at Schools, Libraries, and other groups.

If you know of a group or institution that would like to schedule a star gazing session have them contact: info@vtastro.org

Corona Virus Note: We will follow the current State COVID recommendations.

Green Mountain Astronomers (GMA)

All events start about sunset. Check before going as some events are not cast in stone or written in the stars yet.

Contact Ron Lewis for info
802-779-5913 (cell)
802-247-5913 (home)
vtpoet@gmail.com

Nothing scheduled

New Members

VAS welcomes the following members who joined us since the last newsletter:

Greg Erianne
Russell Lavigne
Jonathan Faris

Meetings/Presentations

Normally meetings are held at Brownell Library, however, due to COVID-19 we are currently holding them remotely. The Zoom link will be posted on the web site under "Events" a couple weeks before each meeting and emailed to members with the meeting reminders.

Meetings are held the first (non-holiday) Monday of the month, at 7:30 P.M. in the Kolvoord Community Room of the **Brownell Library**, 6 Lincoln St., Essex Jct (2nd building north of Essex 5 corners on the left on Rt. 2A). Extra parking is available in the Bank North parking lot across from the library. For inclement weather call Jack St. Louis (802-658-0184) or Paul Walker (802-388-4220) to confirm.

January 10

Advanced Binocular Viewing – Factors & Considerations
By Gary T. Nowak

This presentation is the follow up to Keith Lawrence Binocular Viewing (Basic) talk which was presented on Monday 13 Sept 2021. My advanced talk will look at key factors in choosing the proper astronomical binoculars for your observing situation. Although

these key factors can be used on any astronomical binoculars; the subject matter is specifically aimed at Giant Binocular Usage.

The first section of the presentation will divide astronomical binoculars into 2 main classifications as well as define what are astronomical binoculars and what are Giant Binoculars. The presenter will make some recommendations for astronomical binoculars.

The second section of the presentation will look at certain key factors which play a crucial role in trying to obtain the best visual observations of certain deep sky objects with Giant Binoculars. Some of these factors are: Scotopic Effects, Exit Pupil Considerations, Field of View and Eyepiece Field Contrast.

The third section of the presentation will look at the role of an RFT (Richest Field Telescopes) and how Giant Binoculars can fit into those roles. There will be a review of certain given Giant Binocular (15 X 70, 20 X 80, and 25 X 100) parameter limits which include double star separation limits and magnitude limits (nebulae and stellar). The final section of this presentation will be a comparison of said Giant Binoculars against compatible Richest Field Telescopes. This comparison is based on the presenters many years of data collection from his personal observations. Some folks may find the results



of this comparison quite interesting.

February 7

3 Mini-Talks

- 1) **Starry Messenger...Galileo the trouble maker**
By Cale Shipman

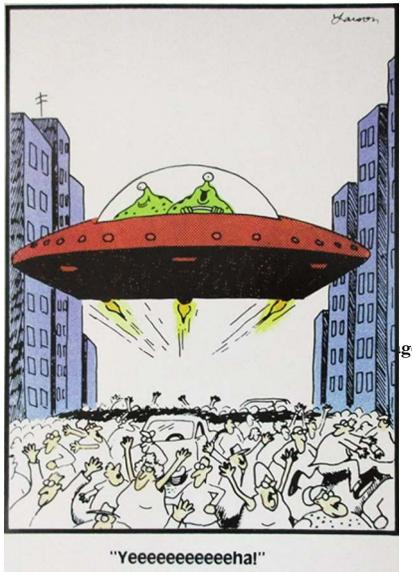


This is a more modern view of someone we always think of as being very old and boring.

- 2) **Aliens Everywhere...or so we are lead to believe**

By Cale Shipman

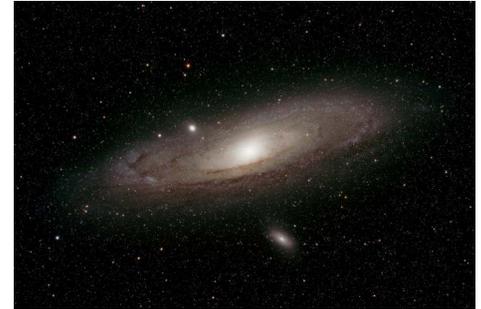
The question we all hate to get at outreach parties. What did Marvin the Martian have against Earth? There seems to Aliens Everywhere these days or so we have heard.



- 3) **Eldorado Star Party, Central Texas - November, 2021**
By Steve Grimsley

The Eldorado star party, at the X-Bar ranch in central Texas, was substantially less productive this year because of much rain and many cloudy nights. Only two and a half nights out of six were good and even those were compromised by spotty transparency and some heavy

dew. It seems as if I brought Vermont weather down south with me this year. Fortunately, I deployed good dew heaters and I was able to continue operations and capture seven images when conditions were clear. My main target was Orion but I captured only one area in this very late rising constellation.



There are 31 notable objects to view and discuss in the images that I acquired this year. My camera scope is an Astro-Physics 92 mm refractor mounted side by side with a Takahashi 78 mm guide-scope. The sharpness and exceptional tracking of this telescope configuration and mount brings out much fine color and detail. Emission and dark nebula, small background galaxies, and open star clusters are most of the types of objects that we will be seeing. This will be a short presentation with an open format for questions and comments on these interesting astronomical objects.

March 7

A Martian Report 2022
By Lisa Kirchberg



MARS

This presentation will be an overview of the current research being done on Mars with the Rover Perseverance.

Articles



NASA Night Sky Notes Nov. 2021

This article is distributed by the NASA Night Sky Network, a coalition of hundreds of astronomy clubs across the US dedicated to astronomy outreach. Visit nightsky.jpl.nasa.gov to find local clubs, events, stargazing info and more.

Measure the Night Sky
David Prosper

Fall and winter months bring longer nights, and with these earlier evenings, even the youngest astronomers can get stargazing. One of the handiest things you can teach a new astronomer is how to measure the sky – and if you haven't yet learned yourself, it's easier than you think!

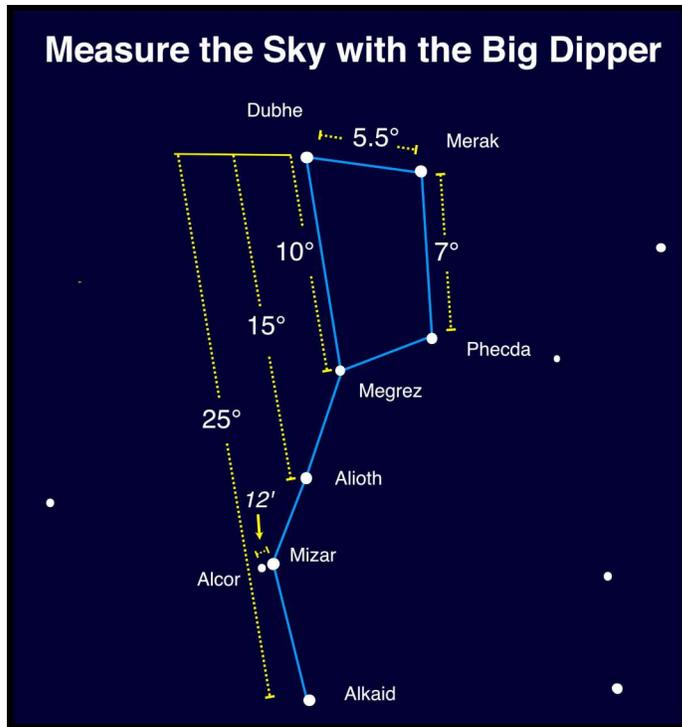
Astronomers measure the sky using degrees, minutes, and seconds as units. These may sound more like terms for measuring time - and that's a good catch! – but today we are focused on measuring angular distance. Degrees are largest, and are each made up of 60 minutes, and each minute is made up of 60 seconds. To start, go outside and imagine yourself in the center of a massive sphere, with yourself at the center, extending out to the stars: appropriately enough, this is called the celestial sphere. A circle contains 360 degrees, so if you have a good view of the horizon all around you, you can slowly spin around exactly once to see what 360 degrees looks like, since you are in effect drawing a circle from inside out, with

yourself at the center! Now break up that circle into quarters, starting from due North; each quarter measures 90 degrees, equal to the distance between each cardinal direction! It measures 90 degrees between due North and due East, and a full 180 degrees along the horizon between due North and due South. Now, switch from a horizontal circle to a vertical one, extending above and below your head. Look straight above your head: this point is called the zenith, the highest point in the sky. Now look down toward the horizon; it measures 90 degrees from the zenith to the horizon. You now have some basic measurements for your sky.

Use a combination of your fingers held at arm's length, along with notable objects in the night sky, to make smaller measurements. A full Moon measures about half a degree in width - or 1/2 of your pinky finger, since each pinky measures 1 degree. The three stars of Orion's Belt create a line about 3 degrees long. The famed "Dig Dipper" asterism is a great reference for Northern Hemisphere observers, since it's circumpolar and visible all night for many. The Dipper's "Pointer Stars," Dubhe and Merak, have 5.5 degrees between them - roughly three middle fingers wide. The entire asterism stretches 25 degrees from

Dubhe to Alkaid - roughly the space between your outstretched thumb and pinky. On the other end of the scale, can you split Mizar and Alcor? They are separated by 12 arc minutes - about 1/5 the width of your pinky.

Keep practicing to build advanced star-hopping skills. How far away is Polaris from the pointer stars of the Big Dipper? Between Spica and Arcturus? Missions like Gaia and Hipparcos measure tiny differences in the angular distance between stars, at an extremely fine level. Precise measurement of the heavens



is known as astrometry. Discover more about how we measure the universe, and the missions that do so, at nasa.gov.

Image created with assistance from Stellarium

Handy Sky Measurements

Hold your hand out in front of your face as far as you comfortably can, and measure:

1°

5°

10°

15°

25°



Board & Committee Meetings

October 21

Board Meeting

Jack opened the meeting. The security bar/door lock for the Teaching Observatory (domed observatory) is installed. Jack donated the cost to the club.

Jim- He has looked into purchasing more solar filter glasses. There is a place we can get 1000 for \$300. Gary N. is interested in being on the Eclipse Committee.

Paul- Sent out dues notices. We

have 96 paid-up members.

Doug- Gave financial update.

Keith- He has almost completed the renovations to the club's 6" f/5 Dobsonian. Several libraries are slated to get Library Loaner Scopes- Lyndonville, Morrisville, Grand Ilse and Stowe. He talked to the guy in Hinesburg who mows the path that goes over the adjacent landfill cap about mowing our site. The person is interested. He lives very close and would only cut it when it needs it.

**November
No Board Meeting**

**December 14
Board Meeting**

Jack opened the meeting

Paul- Working on the Winter 2022 newsletter. The presentations for the next 3 months are set.

Doug- Gave financial update.

Terri- Will to take the position of Treasure from which Doug decided to step down.

Keith- Delivered a Library Loaner Scope to Lyndonville Library. Brad Vietji, a former VAS Member and former VAS President, who lives in the vicinity has agree to handle any maintenance that may be required. Keith is working on a scope for the Stowe library.

Jim- Will set a date for the next Eclipse Committee meeting.

VAS Membership Committee
No meeting was held this quarter.

Observatory Site Committee
No meeting was held this quarter.

Under the Stars & Planets

OBSERVER'S CORNER

Observing Tips

► Before you start each observing session check that your finder scope, red-dot finder (or other "unity" finder is aligned to your telescope. This can be done before it gets dark if there is a fairly distant terrestrial object you can use as target, which, unlike a star or the Moon won't move on you. After dark,

try using Polaris, as it doesn't move much. Put your lowest power eyepiece in the focuser and center the target. You may want to fine tune the alignment by switching to a higher power eyepiece. This can save a lot of time searching for objects.

If you have other tips to share whether for beginners or experienced observers send them our way at info@vtastro.org

On-line Resources

► Here's a really nice, printable Star Atlas. It shows how to go about printing, laminating and binding the atlas. And, even more, with supplements! <http://www.deepskywatch.com/deep-sky-hunter-atlas.html>

Observing Articles

Fast Visual Astronomical Events
By Paul Walker

We typically think of most astronomical events we observe as being slow, occurring over hours or longer in most cases. Some events are over in minutes. An example of events that happen fairly often and are easy to observe in any telescope are some events connected to the Jovian moons.

Though Io takes 1.8 days to orbit Jupiter, it only takes about 3 minutes for it to disappear into Jupiter's shadow. Or in the example in the images below, to reappear from Jupiter's shadow. This sequence is from a video taken on 11/29/21 at about 5:41 PM EST.



~ 30 seconds after start of egress



25 second after above image



1m 25s after top image

Io brightened fast enough to perceive it happening. The moons from left to right are Ganymede, Europa, Io, Callisto.

Another example of relatively fast Jovian moon events are the conjunction of moons and eclipses of one moon by another. Below is an example of a conjunction that took place about an hour and a half after the video was taken. Io was on the backside of its orbit and appearing to move away from Jupiter while Europa was on its front side moving toward Jupiter.



7:10 PM EST



7:14 PM EST

The easiest way to check if there are any interesting Jovian moon events on the next clear night is to use planetarium software, if you have one available. If you get Sky & Telescope magazine they provide detailed information on these events in the Observing section in the middle of the magazine. Astronomy magazine provided a graph of the moons' movements. Looking for times that the moons' paths cross each other on this graph you can estimate the timing of these events to about an hour or hour and a half.

2 weeks later on 12/12/21 I observed another conjunction of Io and Europa, only this time Europe was in back and Io in front.

Image information:

Telescope: 10" f/5.6 on equatorial mount.

Camera: Canon Rebel T7i at prime focus (for both the video and still shots). The first 3 images are individual frames from a video. The last 2 are from prime focus still shots. All images are cropped.

Member's Observations

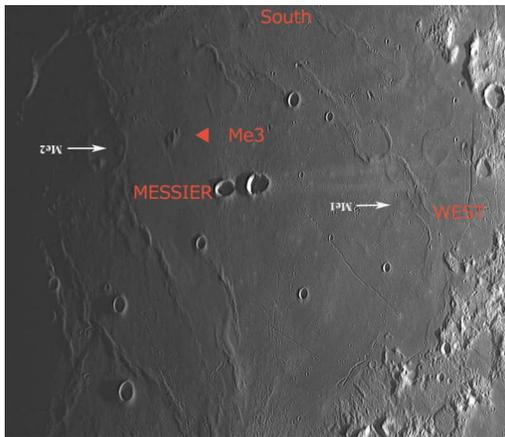
Lunar Domes

Dome Me3 southeast of Messier & Messier A craters in Mare Fecunditatis

I used the much better seeing of last night to spot a lunar dome by Messier crater, called Me 3. Using my cast-away telescope, a 6" Newtonian, at 96x and a Badder 495nm filter.

Seen here below. While the dome size is listed at 6.44", I observed the shadowed area of the dome and the nearby crater. The seeing held a very short time, perhaps 10 minutes of best viewing.

The image is an ALPO dome study chart.



2021-11-09
Lawrence Garrett

By coincidence I imaged the Moon the same night as Lawrence's observation. Lunar dome Me 3 is detectable on 25 of the images.

I had viewed Venus and the Moon and noted that in spite of their low altitude the view was surprisingly good. So I got my DSLR and took some shots of them as well as Saturn and Jupiter.

North is down. This is a combination of the 2 best images. Same orienta-



tion as the ALPO reference image Lawrence provided but you will notice in the reference the Sun is setting over the area where as last night the Sun was rising.

Technical details: 11/8/21, 5:06 PM, prime focus on a 10" f/5.6 Newtonian, 1/100 sec, ISO 400, Canon T7i camera. Image is cropped.

2021-11-09
Paul Walker

While searching to see if I had a reasonable image of Cauchy Domes C2 and C3, I came across the image below of Messier and Messier A. It shows dome Me3 much better than my other image. Though the other better represents what one may be able to see from Vermont on a good night. This image is a stack of 600 video frames taken on 2019-05-08 with a Nikon Coolpix AW-110 camera on a 10" f/5.6 scope.

Paul



Cauchy Domes C2 and C3 in the northeastern corner of Mare Tranquillitatis and just West of Franz and Lyell Craters (see labels on Lawrence's drawing)

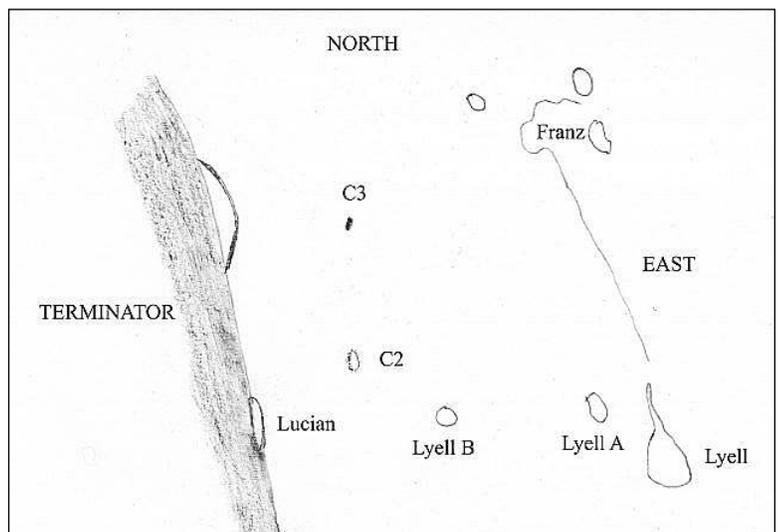
I have wanted to do a Lunar Gazette on lunar domes, as I have observed some 23 this fall. These were 19 in the Marius dome field (a challenge at high power in a 12.5"), as well as two Cauchy domes, with a drawing posted at the ALPO lunar dome pages. And two others' as of late. I also landed another successful asteroid occultation video.

But these domes are tough subjects, so my first introduction to domes are little tidbits.

Take this drawing below, the one I posted at ALPO, the Cauchy domes C2 (2.28" across) and C3 (5.37") are under 20 seconds of arc from the terminator! Maybe only 15" (using GUIDE 9.0). Done with a 6 inch telescope, these domes were only a planetary disk distance from the terminator! Talk about "walking the line". Observation time in this case was under 15 minutes with the best conditions quickly changing. The major features held much longer of course.

The Moon was quite low as well. This may be a new zone you might never of suspected to hold interesting, challenging features.

It was another "stolen" night. Finding the right place and time. This type of observing fits right into the theme of the Lunar Gazette, an observation that would have been missed without that closer look. It could even be called a "Porter Garden Telescope" night (see



[Telescopes of Vermont Garden Telescopes - The Porter Garden Telescope.\)](#)

No advanced computerized telescope required. All that's needed is some careful work at the computer finding your target field and subjects. Brief observing with worthwhile finds. Want to go dome hunting? Just write.

2021-11-21

Lawrence Garrett

Lunar Eclipse 2021/11/19

Hi I am sooo glad I got up at 3AM!!!

As I'm sure most of you know, the sky looked quite dubious, pretty much all night, but I had set my alarm for 3 anyway, and thought that I might as well get dressed and go wait in the observatory for a while. The coyotes were having an early hootenanny, which was panned by a single "Hoot!" from an owl. The sky showed only the slightest glimmer of a sliver of the moon, with me desperately shooting into the void, hoping my camera could see more than I, to no avail. That is, until about 4:24, when, all of a sudden, there were stars! And then the moon was cleared, and the view literally brought tears to my eyes. My photos do the view no justice, but the expanse is seared into my head. Orion and Canis Major and the moon above my tree line, before clouds rolled back in. It just doesn't get any better than that. Here are a couple of my better shots...(see Members Images)

Not the best shots I've done, but just reminders of the sights I had.

2021-11-19

Peter Gillette

Peter, I had the same experience of having one short span during which the clouds disappeared and I was treated to a beautiful view of Orion and the delicate orange of the moon. Impossible to capture.

Here are my two best wide-angle shots (in the second you can make out the Pleiades). (see Members Images)

Greg Warrington

Things to Observe

Hubble's Variable Nebula

(Caldwell 46, NGC 2261)

Located in Monoceros at RA 6h 39m 10s, DEC +8deg 45min, which is about a degree away from the Christmas Tree Cluster (NGC 2264).

It is a triangular shaped reflection nebula with a bright corner (which is lit by the star R Monocerotis, which can't be seen directly), though it changes in shape and brightness. Eventually astronomers figured out why it changes. From NASA: "Dense condensations of dust near the star cast shadows out into the nebula, and as they move the illumination changes, giving rise to the variations first noted by Hubble." You don't need a large scope to see it (from what I've read, a 3" scope is enough), though you'll get more detail the larger your scope. Come back at a later date to see what changes you notice!

Constellation of the "Month"

Adapted from Terri Zittritsch's "Constellation of the Month" that she presents at the club's monthly meetings.

Pegasus

Pronounced – PEG-uh-suss. It is one of the largest constellations in the sky.

In Greek mythology Pegasus is the winged horse that sprang from the neck of the Gorgon Medusa after Perseus beheaded her. Zeus also used Pegasus to carry his thunder and lightning for which Zeus placed Pegasus into the skies.

It contains the asterism the Great Square of Pegasus.

Finding Pegasus

There are various sign posts to Pegasus, though once you are familiar with the Great Square of Pegasus, you will likely not need them and in fact may find yourself using the Great Square as a signpost to the faint constellations surrounding it. This time of year, before Cygnus sets, it can be used to point the way. If you are familiar with Cassiopeia, which is fairly easy to spot high in the northern sky in the winter, it will point the way. (see map below).

Bright Stars

The Great Square is made up of (starting at northern most intersection with Andromeda and brightest) Alpheratz (2.0), Beta – Scheat (2.5) Alpha - Markab (2.5), Gamma – Algenib (2.8).

Double Stars

- HD204509 (HIP 106053)– mag 6.4 and 7.5 at 1.9" of separation. Just 1 deg. SW of M15.
- HD 8364 (HIP 108119)– mag 6.3 and 8.0 at 22" separation
- 72 Pegasi – mag 5.0 and 6.1 at 0.6" separation
- 78 Pegasi – mag 4.9 and 8.0 at 0.9" separation

One Messier and numerous, but dim, NGC objects

- M15 (NGC 7078) Globular Cluster– Mag 6.3, > 100,000 stars with a strongly condensed core and emits x-rays which leads some to think there is a black hole at its center. M15 was also the first globular cluster to have a planetary nebula dis-



scope magazine. In a dark enough sky this double is visible as single star to the unaided eye with its components at magnitude 5.2 and 6.1. With a separation of 32" arc arc they are both discernable in binoculars. The article mentioned that it was good time to visually detect their movement because they were passing a mag 10 background star. Unfortunately I didn't read the article until they had passed the star. But then, had I started the imaging sequence much earlier I would have covered up the 10th magnitude star.



I have now been imaging this pair once a year for 8 years. This is a cropped composite of those images each of which is a stack of 20 to 30 5 second images through my 10" f/5.6 Newtonian, a 2x Barlow and DSLR camera. The 2x Barlow gives more separation with less cropping and I still have enough field of view for over 100 years worth of images :) 5 seconds works best for the composite but I also have been taking 12 sec and 30 sec exposures which may work best for creating an animation of their movement.

**Searching For Dark Nebula
in a Dark Night Sky
By Maura Kelley**

Dark nebula, also known as an 'absorption nebula', is a type of interstellar cloud containing a very high concentration of interstellar dust that is so dense that it scatters, absorbs, and blocks visible light from objects behind it. This dust is usually located in the coldest, densest parts of molecular clouds.

Dark nebulae are so interesting and mysteriously beautiful to me, so I searched for something I've been looking at in photos online for some time now: Barnard 22 - a part of the Taurus Molecular Cloud.

Armed with just my DSLR camera on my equatorial mount, it's looking for a dark nebula in a dark night sky, so I have to look for star patterns only. Not too easy using just a DSLR camera!

A small bit of guidance was provided from someone in my 'GoTo's' catalog: IC 2087, the Little Flame Nebula, close by but small and non-discernible in a sub exposure.

When you look at Barnard 22 online, you are typically seeing about 50 hours of integrated exposure time. Image 1 is the result of 5.59 hours over 3 nights (actually 4 nights, but 1 night's work was completely lost due to my own computer mess-up), using a 300mm camera lens.

Image 2 in widefield (40mm camera), you can see the California Nebula (NGC 1499) and The Pleiades, a.k.a. 'The Seven Sisters', Messier 45 (1.84 hrs. integrated exposure time over 2 nights in Nov.) and in between them, you can notice brownish dust

trails containing dark nebulae, a part of the Taurus Molecular Cloud! Barnard 22 is located just barely out of this frame to the south, along this dark nebula trail.

We keep working on our projects to make them better. I'm not done with this one yet. I'm staying on the trail.

Image 1 - Barnard 22

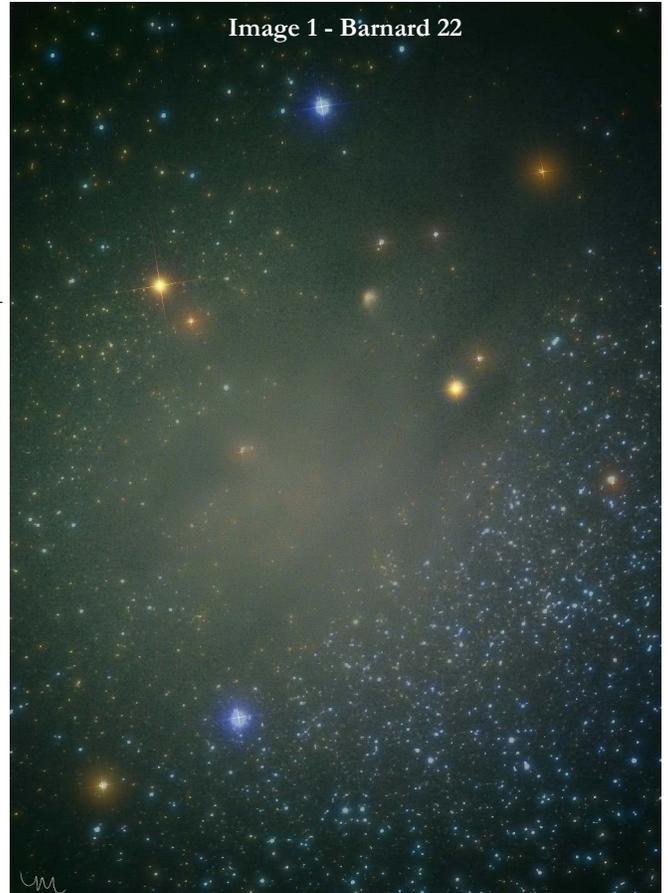
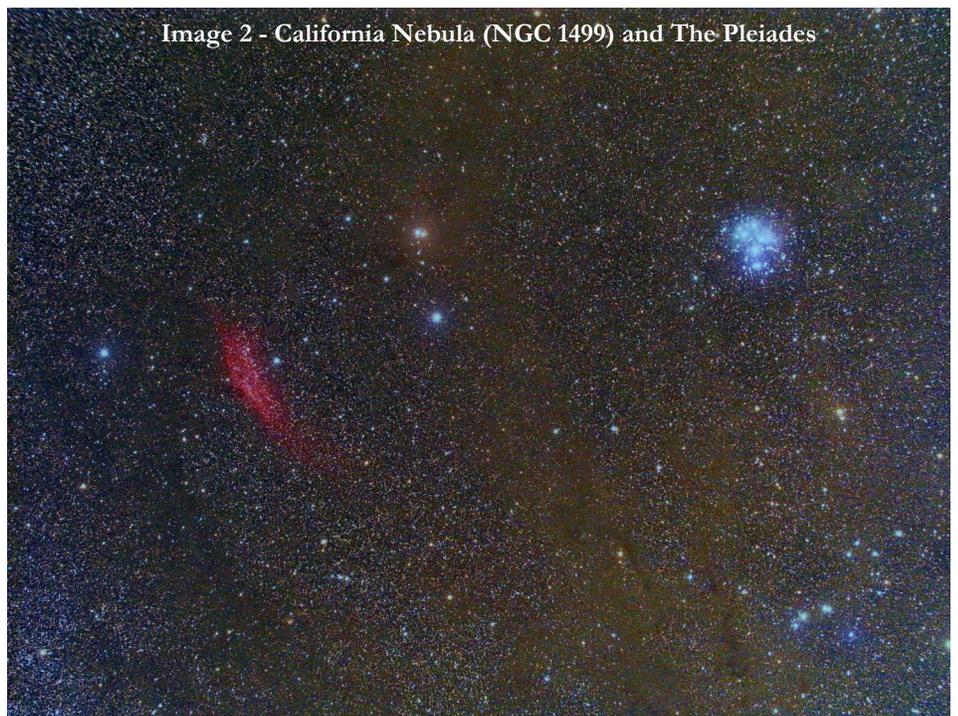


Image 2 - California Nebula (NGC 1499) and The Pleiades



MEMBER'S IMAGES



Lunar Eclipse
By Peter Gillette

Captured on 2021/11/19 at 5:21 AM.

Canon Powershot SX50 HS, 0.8sec, F/6.5, ISO 640, 1200mm FL (35mm equivalent), tripod mounted, using a wireless shutter-release.



Lunar Eclipse, Iridescent Clouds and the Pleiades
By Greg Warrington

Captured on 2021/11/19.

Nikon D200 (crop sensor) on tripod, ISO 200, 50mm @ f/2, 1 sec.

Brightness/contrast adjustments. Crop of the original image. The color in the clouds is called iridescence and is caused by ice crystals or water droplets.



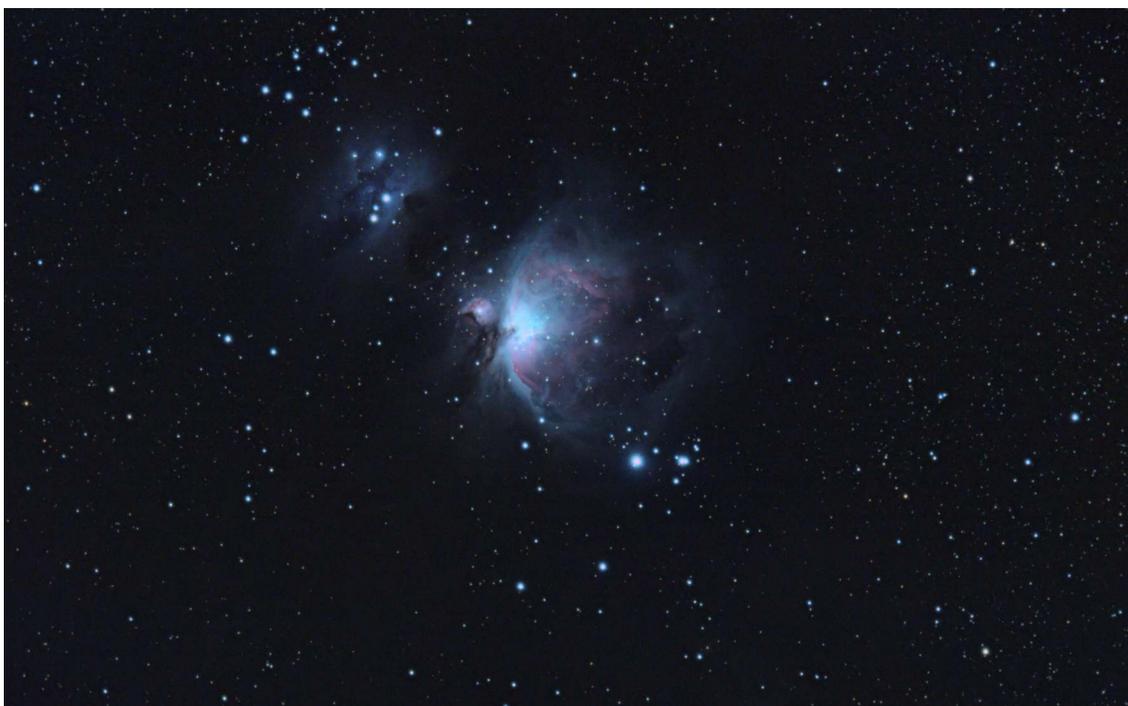
Comet 2021 (A1) Leonard

By Rick Daniell

Captured on 12/4/21, Saturday morning, around 4:00 am.

Skies were clear (and cold), I managed to capture roughly 75 sub frames at a 60s exposure.

Scope was my RC8 with a QHY8l ccd camera. Processed in Pixinsight.

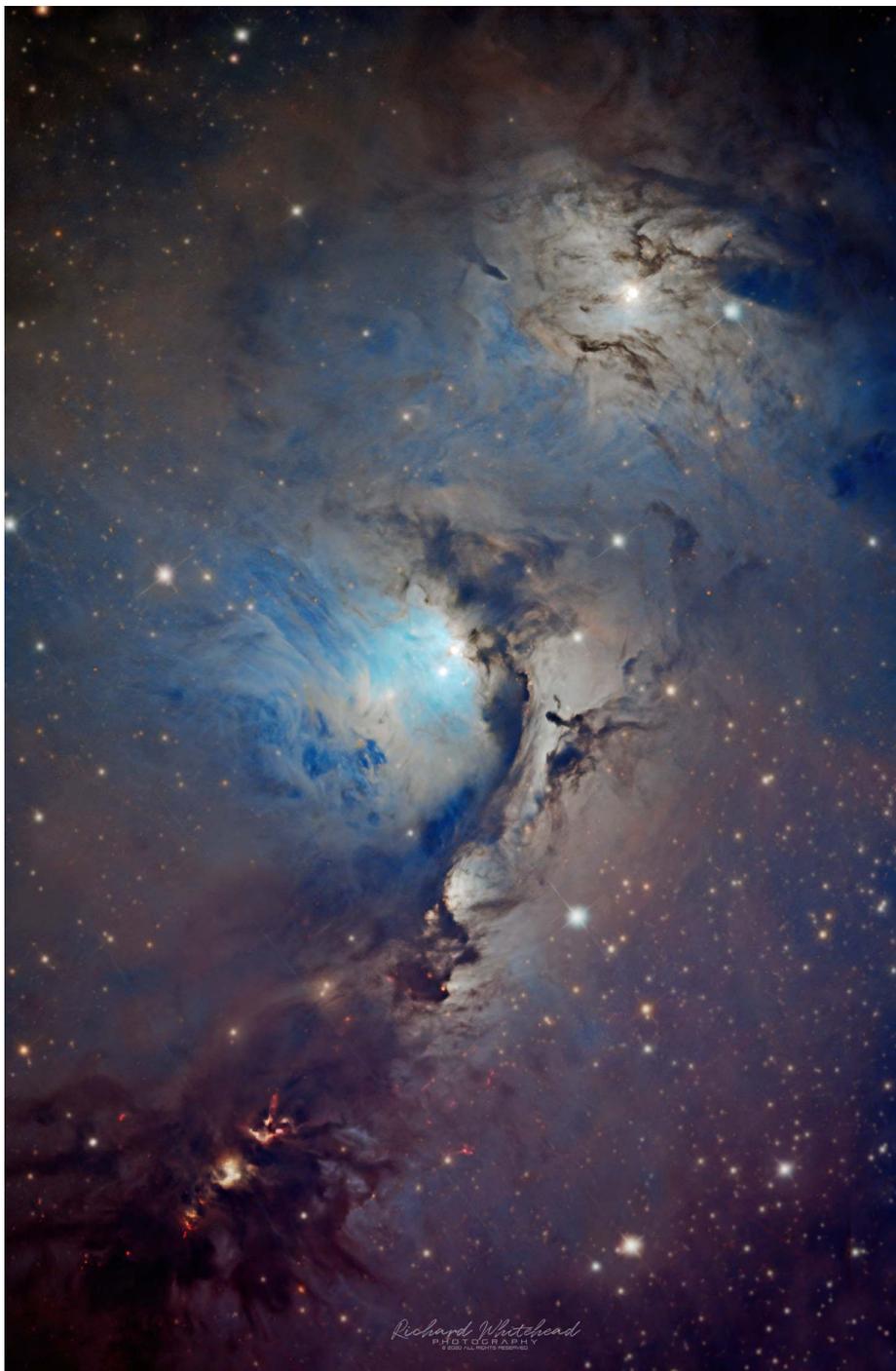


M42 (Orion Nebula) and M43 (Running Man Nebula)

By Greg Erienne

Here's my first processed photo with my Apertura 60EDR/Canon SL3 (250D) combination. Unfortunately, the moon was at about 73% brightness and I didn't use any filters so my lights were a bit over-exposed and they had a large gradient in them. I was really thrilled to get anything out of them.

Canon EOS Rebel SL3 (24 Mp, APS-C), Apertura 60EDR scope with field flattener (360mm f.l., f/6; 576mm effective), 24 x 3 min each for lights; used darks, flats and bias frames, ISO 800, SkyGuider Pro, autoguided with ZWO 30mm f/4 miniscope (120mm f.l.) and ASIAir Plus, processed in Siril & Photoshop, Sky condition- Bortle 3/4 (Monkton, VT)



M78

By Richard Whitehead

Messier 78 is the other (IMHO) "great" nebula in Orion, sitting just above Orion's belt. M78 and its companion nebulae NGC 2064, NGC 2967, and NGC 2071 are reflection nebulae in the Orion B molecular cloud. Reflection nebulae are where surrounding gas and dust is illuminated by stars. They are usually blue in color, and for the same reasons our home world skies are blue.

The curvilinear shapes are carved out by the stellar wind of some very energetic stars. Towards the bottom of the image are some red stars, colored this way due to the large amounts of dust between them and us.

M78 is the bright area in the center of the image, to the right of this there is a swirl of dust that looks just like the eye-wall of a hurricane, and the side lighting gives some 3-D information about the structure.

Lower to the left there is a dark nebula with tendrils and orange /red starlight peeping through, one day the dust will be blown away and we'll see the stars behind this (as we can in the infra-red spectrum), but for now it looks kind of creepy ??

M78 is 1350 light years away from earth, is also a stellar birthplace and home to 17 Herbig-Haro objects (energetic jets from new born stars).

I shot this image over 6 nights from the New Mexico desert, M78 still being a late riser so this image was shot at low elevation in the early hours of the morning. This is a full-frame image with minimal cropping at 2560mm focal length @ f7.

After the pesky Moon is out of the way I'm going to continue to collect data on this subject.

Tech stuff:

Scope : Planewave CDK14

Mount : Planewave L-350

Camera : ZWO ASI 6200 MM Pro ZWO filter wheel Astronomik filters

24 x 10 min Red

20 x10 min Green

18 x10 min Blue

All unguided. Darks, no flats.

Shot as Bin 1 down sampled to Bin 2x2 in Pixinsight

This and more astro-art at <https://fineartamerica.com/profiles/2-richard-whitehead>



Fish Head Nebula
By Richard Whitehead

Also known as the Fish Nebula is small part of the molecular cloud that makes up the Heart Nebula (see Terri's image on the next page).

I'd been working on this for a few days and realized that my camera has very small pixels at 3.76 microns (62 Million of them!) and that are causing over sampling on such a long focal length, considering the limits of the seeing. So I tried down-sampling in software taking my Bin 1 stacks and converting them to Bin 2x2 (in Pixinsight). Quite an amazing effect on star size! So I guess this is the way to go with long f.l.

The Fish Head Nebula (IC 1795, NGC 896) is a star forming region in Cassiopeia, and part of the Heart Nebula Complex. Often seen as an appendage in wide field shots, close up it has some fascinating dust lanes, back lighting and reflection as well as emission components.

It's relatively close to Earth at 6000 light years. This image is shot in SHO (Hubble Palette) and is full frame (no cropping) at 2650mm Focal length.

I shot this over 4 nights in mid-October on my Planewave CDK14 out in the New Mexico desert. This was my first test of 15 min unguided sub shooting on the Planewave mounted on an L-350 mount. I was able to use about 80% of all subs.

Tech stuff:

Scope : Planewave CDK14

Mount : Planewave L-350

Camera : ZWO ASI 6200 MM Pro

ZWO filter wheel Astronomik filters

35 x 15 min Ha 12nm

30 x 15 Min OIII 12nm

24 x 15 Min SII 12nm

Shot as Bin 1 downsampled to Bin

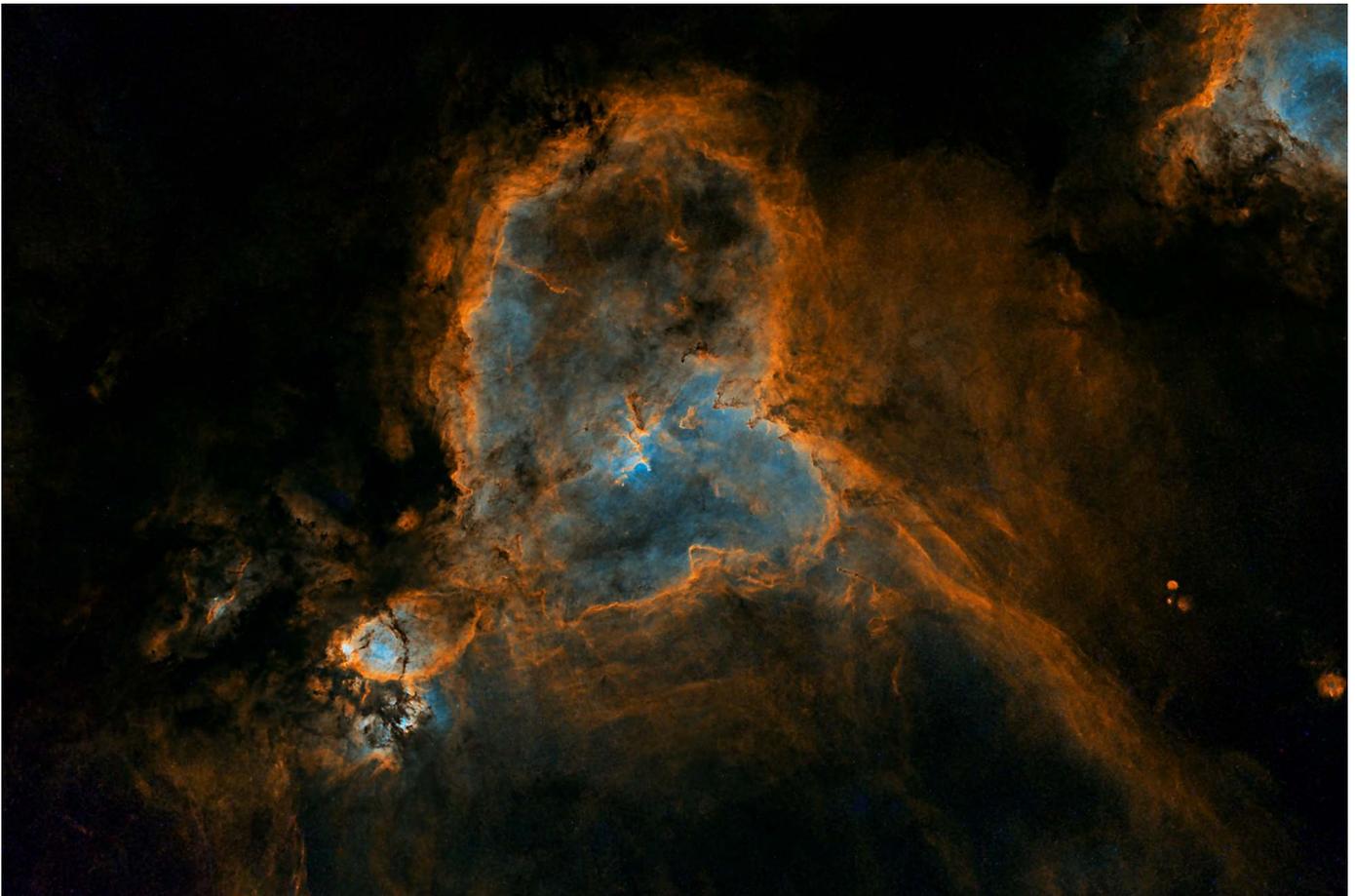
2x2 in Pixinsight

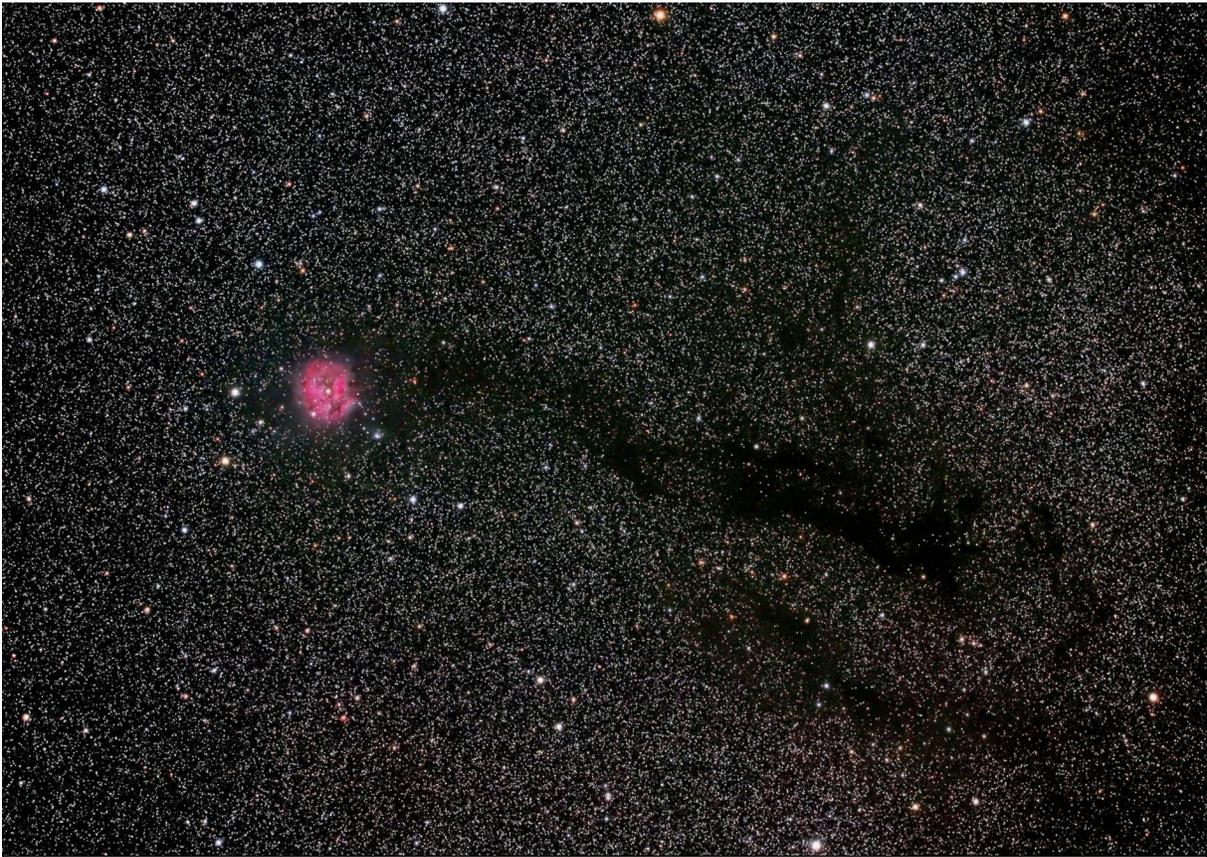
Processing Pixinsight and PS 2021



**IC1805 and NGC896 (IC 1795) with and without Stars
By Terri Zittritsch**

Here's the Heart and Fish nebulae in SHO (Hubble) palette. This took 20 minute exposures on my AP92 Stowaway APO. I used the ZWOASI6200 mono camera with Chroma 3nm filters. I did an experiment with this image and shot it at 2x2 binning, and then once I processed it, I drizzled the data to gather back some resolution from the under-sampled image. I think it worked well. While the data amount for this kind of narrow band image isn't that great, e.g. how many 20 minute images can you really take, but would be much more useful when shooting 2 minute luminance images where I may take > 100. And the 100MB files for the full resolution of this camera take a lot of space. In any case, I thought it interesting. Below is IC1805 and NGC896 without the stars. An interesting composition as it really highlights the gas and dust.

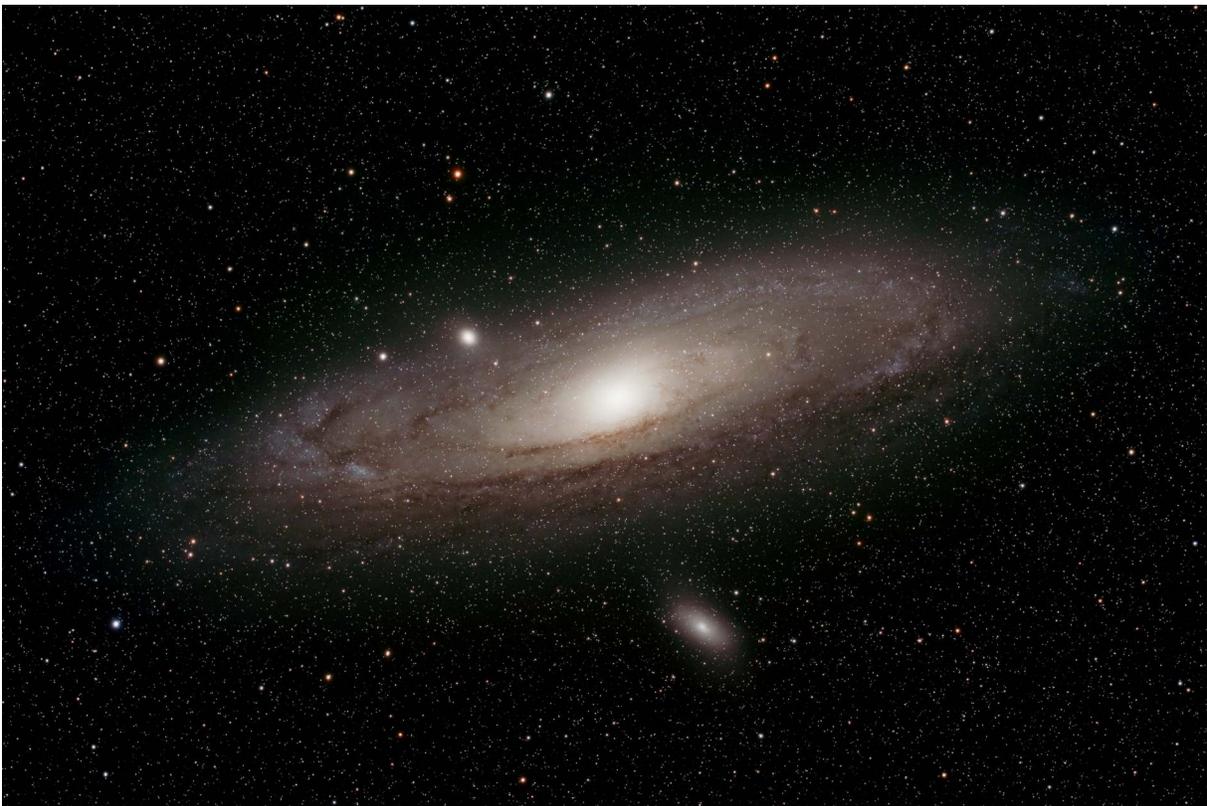




The Cocoon Nebula (IC 5146)

By Steve Grimsley

Taken at the Eldorado Star Party in Texas. Astro Physics 92mm f/7, Mount is a Takahashi NJP with the PD7XY control with manual override. Canon Ra camera, ISO 800, 7 min. exp, 10 subs.



M31 (The Andromeday Galaxy)

By Steve Grimsley

Taken at the Eldorado Star Party in Texas. Astro Physics 92mm f/7, Mount is a Takahashi NJP with the PD7XY control with manual override. Canon Ra camera, ISO 800, 7 min. exp, 10 subs.



Geminid Meteors
By Allon Wildgust

2021-12-14. Early Tuesday morning (1 AM) I went out to catch the Geminid meteor shower. To my surprise the clear skies of the daytime was now totally cloudy. The Moon set about 2 AM so I waited hoping for some holes and slowly the eastern sky cleared so about 3 AM the whole sky was clear and I saw meteors. By 5 AM I saw probably over 20-30. I set up my double barn door tracker and photographed the sky with a 10 mm lens catching at least six meteors. This is an composite of 11, 1 minute images stacked with three meteors. The brightest meteor produced a smoke train which was caught in the same image. It is enhanced here. This as approx. a 50% crop.



Geminid Meteors
By Paul Walker

Here is a composite and cropped image consisting of 4 of 16 meteors I caught. Castor and Pollux are the 2 bright stars in the upper left are near the shower's radiant. North is to the lower left. The feet of Gemini are out of the frame to the upper left. Regulus is the brightest star just under the upper right meteor. The head of Leo is bottom side up on the right center and raps around a faint meteor. The trail of the brightest meteor goes right through M44 (The Beehive Cluster in Cancer). It also produced a smoke train which is enhanced here and is a composite from 2 images. Look carefully and you can see faint reddish areas on either side of the left end of the trail.

Camera Canon T7i (24Mp, APS-C sized sensor), 18-55mm lens @18mm f/3.5, ISO 1600, 20 second exposures, iOptron Star Tracker.

Space Science Roundup



NASA Nattering

--by Scott Turnbull, VAS Member and Solar System Ambassador volunteering for JPL/NASA
This edition's nattering about NASA is an eclectic collection of updates and impending events. First, I'd like to thank all the folks who tuned in to my meandering musings on the James Webb Space Telescope when I was the featured speaker at the December VAS meeting. There was quite a turn out and I appreciate your interest.

HUBBLE Returns to Service (again)



NASA's Hubble Space Telescope team recovered use of the Space Telescope Imaging Spectrograph on December 6 and is now operating with all four active instruments collecting science. The team has still not detected any further synchronization message issues which put the telescope in a quiesced safe mode on November 1st.

The team continues to work on developing and testing changes to instrument software that would allow science operations to continue even if lost synchronization messages occur in the future. The first of these changes is scheduled to be installed on the Cosmic Origins Spectrograph in December. The other instruments will receive similar updates in the coming months.

Hubble has been operating for over 31 years, collecting science observations that have changed our fundamental understanding of the universe. With the launch of the Webb Telescope planned for late December, NASA expects the two observatories will work together well into this decade, expanding our knowledge of the cosmos even further.

Ingenuity Continues to Fly

The Ingenuity helicopter has recently completed its seventeenth flight on the planet Mars. The original plan for last May was for a technology demonstration consisting of 3 flights over the course of a month. The goal was to demonstrate that autonomous flight was possible on Mars. Ingenuity accomplished that goal with aplomb, and so much more. The demonstration flights were expanded and extended. The aircraft performed so well that the activities were redesignated as an operations demonstration. Ingenuity has scouted ahead of the Perseverance Rover and also explored terrain that the rover could not safely navigate. Over 30 minutes of flight time has been accumulated. The Helicopter has landed at 9 different locations as part of its 17 flights.



Parker Solar Probe Touches the Sun



NASA's Parker Solar Probe has spent more than three years winding its way by the inner planets and passing ever closer to our star to learn more about the origin of the solar wind. Observations from Parker's April 28 flyby show that the spacecraft passed within the sun's corona for the first time. This was the 8th time Parker had approached the sun. The encounter has helped to more accurately define the nature of the Alfvén critical surface. That surface represents the distance from the sun at which the solar winds flow away from the sun. Emissions that don't exceed that distance are pulled back into the sun. Parker's data suggests it crossed the critical surface 13 million km above the sun's surface. More importantly, Parker found the critical surface is not uniform. There are variations in which the surface protrudes higher or lower from the center of the sun. The surface also likely varies with solar wind activity.

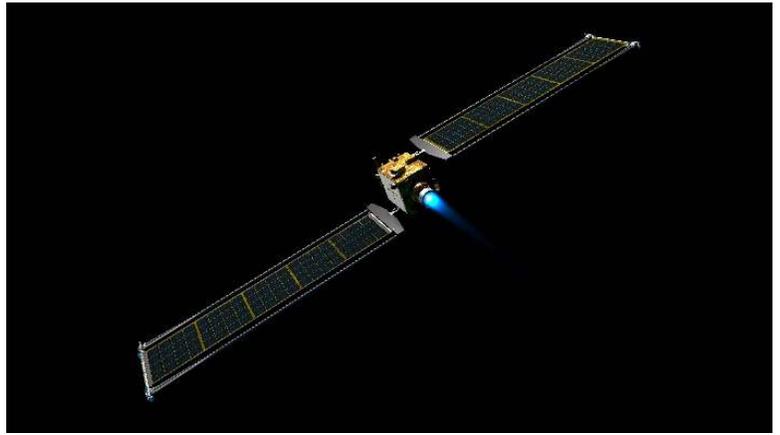
DART Game for Planetary Defense

The Double Asteroid Redirection Test (DART) spacecraft was launched by NASA using a SpaceX booster on November 23rd and is cruising towards a rendezvous with history.

DART is a planetary defense-driven test of technologies for preventing an impact of Earth by a hazardous asteroid. DART will be the first demonstration of the kinetic impactor technique to change the motion of an asteroid in space.

The binary near-Earth asteroid (65803) Didymos is the target for the DART demonstration. While the Didymos primary body is approximately 780 meters across, its secondary body (or “moonlet”) is about 160-meters in size, which is more typical of the size of asteroids that could pose the most likely significant threat to Earth. The Didymos binary is being intensely observed using telescopes on Earth to precisely measure its properties before DART arrives. DART’s target asteroid is NOT a threat to Earth. This asteroid system is a perfect testing ground to see if intentionally crashing a spacecraft into an asteroid is an effective way to change its course.

The DART spacecraft will intercept Didymos’ moonlet in late September 2022, when the Didymos system is within 11 million kilometers of Earth, enabling observations by ground-based telescopes and planetary radar to measure the change in momentum imparted to the moonlet.



Resources

Information presented in this article was provided by the NASA/JPL mission web sites.

For more information, please refer to

https://www.nasa.gov/mission_pages/hubble/main/index.html

<https://mars.nasa.gov/technology/helicopter/>

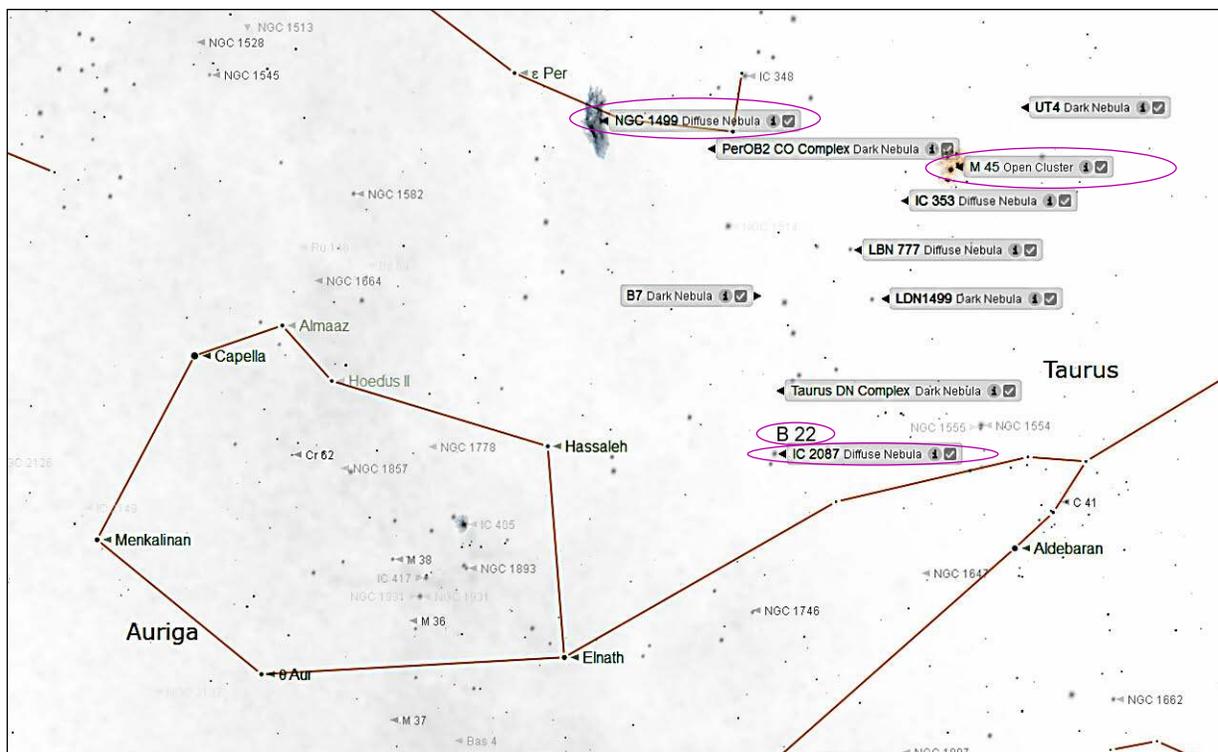
<https://mars.nasa.gov/technology/helicopter/#Flight-Log>

<https://www.nasa.gov/feature/goddard/2021/nasa-enters-the-solar-atmosphere-for-the-first-time-bringing-new-discoveries>

<https://www.nasa.gov/planetarydefense/dart>

Location Charts for the deep sky object images in this issue.

Created using Starry Night Pro 8 & Picture Window Pro 7.





Crescent Moon with Earthshine

2021/11/06, 2.09 days old

By Paul Walker

Canon T7i (24Mp, APS-C sized sensor), 75-300mm lens @220mm f/6.3, ISO 1600, 1/10 second exposure.

Wanted

Wanted - First telescope program - I am working to recycle old 4.5" reflectors to construct starter Dobsonian telescopes for first time users. I am looking for donations of old telescopes, 1 1/4" rack and pinion focusers, Plossl eyepieces and other parts..

Contact Keith Lawrence, 802-453-5496, sleepingbearwoodworking@yahoo.com

For Sale

Light duty machining for custom brackets/adaptor and modifications to existing hardware for astronomy purposes.

Nominal fee (~\$10 - \$50 depending on size and complexity).

I have a have mini milling machine and a mini lathe.

Paul Walker 802-388-4220 or paulwaav@together.net

Baader Contrast Booster filter with IR-Cut, 2" - Excellent condition, Asking \$130 (new\$147).
Tele Vue 55mm Plossl 2" eyepiece.
 Asking \$200 (new \$256.)

Contact Greg Erianne, 203-206-9116, greg.erianne@gmail.com

Bresser AR102S wide-field achromatic refractor OTA: asking \$150
Vixen 32mm Plossl eyepiece: \$35
Old Vixen 1.25" prism diagonal: \$40

Contact Siddhesh Mukerji, siddmukerji@gmail.com

Copies of "Mirror Mirror" - A History of the Human Love Affair with Reflection by Mark Pendergrast of Colchester, Vt. available for \$25. Mark will split the profits with VAS.
 Contact Mark at markp508@gmail.com or see Jack St. Louis at any monthly meeting.

Celestron Evolution 9.25" SCT f/10

- Single arm mount with GoTo and wifi, can be controlled with the included hand controller or a phone/tablet app.
- Red dot finder
- Heavy duty tripod
- AstroZap dew shield
- Celestron Eyepiece and filter kit
- Used 5 or 6 times at the most.

Asking \$2300.00

Contact: Patrick Porch, 802-236-2463 pcwizard2600@gmail.com

8" Celestron Schmidt-Cassegrain on a CGEM computerized mount

Included accessories:

9.25" Glass solar Filter	\$ 124
9mm eyepiece	\$ 30
25mm MA eyepiece	\$ 30
90 deg star diagonal	\$ 44
T-Adapter-SC	\$ 25
Universal camera adapter	\$ 75

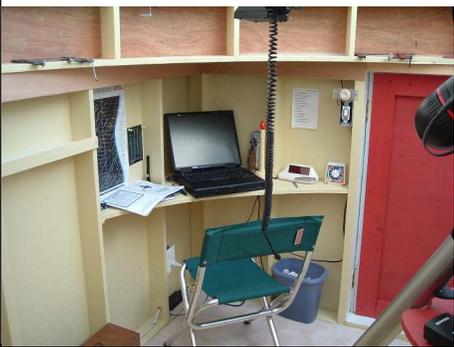
Total Cost New \$2828

Asking (for the package) \$2500

Myron Dunbar, 405-779-8102
Medunbar54@gmail.com

Complete astro observatory with 8-ft Exploradome. Equipped with Meade 14-inch Advanced Coma Free SCT and accessories including heavy-duty polar-alignment wedge, heavy duty tripod, autoguider, dew shield, and other accessories. Over \$11K invested, asking \$5K.

Al Boudreau at astromanvt@gmavt.net



Celestron NexGuide Autoguider

I purchased used at the Stellafane Swap Tables as a backup to the one I am using, however, I forgot had already purchased a backup at the Swap Tables the previous year. I don't really need 2 spares.

\$140 OBO. (\$300 new)

Paul Walker 802-388-4220 or paulwaav@together.net

Telescope mirrors and a couple mounting cells
3.5" f/10 with 3/4" diagonal.
6", probably f/8.
8", probably f/8, in nice cast aluminum cell.

10" f/9, 1/10 wave (measured by Bob several years ago), Beral coating that is in good condition though the edge has several chips (edge not beveled) and a note from the coater says there are a few scratches and it is not fully polished (may be saying that because of the scratches). From St. Michael's College.

Other than the 10" f/9 I cannot vouch for the figure of the mirrors.

The only one that may be Pyrex is the 8" mirror, I'd have to pull it out of the cell and look again. The rest have the slight greenish-yellow tint of plate glass.

Make an offer on any of the items.

Paul Walker 802-388-4220 or paulwaav@together.net

Observing Aids for sale

Observing chairs - Enjoy longer observing sessions. Adjustable seat height for comfort and better viewing. **Starting at \$90.**

Binocular parallelogram mounts - Raise and lower your binoculars while maintaining an object in the field of view. Work well for use with lounge chair for observing at higher elevation or for multiple observers of different height. I will fit your binoculars to the mount for optimum performance. **Starting at \$195.**

Binocular mount for your tripod - replace the bracket with a system that keeps the binoculars in balance. Find an object, release the binoculars and they stay where their pointed. **\$50**
Clip on red book lights with variable brightness - I am working on modifying these for use on clip boards etc. If you have an interest please email or call me to discuss your need.

Contact Keith Lawrence, 802-453-5496, sleepingbearwoodworking@yahoo.com

First Telescope Program



With the support of the VAS Board, I am developing a First Telescope Program for new members of the club. For now I am seeking a few of the old 4 1/2" f/8 Newtonian telescopes that I can renovate, fit with 1 1/4" rack and pinions and eyepieces then outfit with Dobsonian mounts. **My target is to sell these to club members for \$100 or non-members for \$125.** For the first year the new owners can return it for full refund in case of non-use or to upgrade, etc. After a year the refund will depend on condition. Sales will depend on availability of telescopes and components, so if you have old telescopes, eyepieces or parts you want to sell or donate or if you know of someone who would like an inexpensive telescope that really works, please contact me.

Contact Keith Lawrence, 802-453-5496, sleepingbearwoodworking@yahoo.com